

STUDIES IN THE GENERA OF THE DIOSMEAE (RUTACEAE): 12. A REVISION OF THE GENUS *PHYLLOSMA* AND A PROPOSED NEW GENUS *SHEILANTHERA*

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ABSTRACT

The diagnostic characters of the monotypic genus *Phyllosma* are redefined to include one more species transferred from the genus *Acmadenia*. A monotypic genus is proposed to accommodate the new species *Sheilanthra pubens* Williams.

UITTREKSEL

STUDIES IN DIE GENERA VAN DIE DIOSMEAE (RUTACEAE): 12. 'N HERSIENING VAN DIE GESLAG *PHYLLOSMA* EN 'N VOORGESTELDE NUWE GESLAG *SHEILANTHERA*

Die diagnostiese kenmerke van die monotipiese geslag *Phyllosma* word herbepaal om 'n verdere soort in te sluit wat uit die geslag *Acmadenia* oorgeplaas is. 'n Monotipiese geslag word voorgestel om die nuwe soort *Sheilanthra pubens* Williams te beskryf.

HISTORICAL BACKGROUND

The monotypic genus *Phyllosma* was described by H. Bolus in 1898 from a specimen collected by Rudolph Schlechter on the Koudeberg near Wupperthal in 1896. Since then it has been collected several times, from localities widely scattered in the drier parts of the mountains of the Clanwilliam and Ceres Divisions. Bolus did not mention any herbarium in which the type material was preserved.

However the specimen (*Schlechter 8781*) in the Bolus Herbarium at the University of Cape Town is accompanied by manuscript notes in Bolus's handwriting together with his dissections of the flower. This is therefore most certainly the holotype being the material used by Bolus in the preparation of his descriptions of *Phyllosma capensis*.

***Phyllosma* H. Bolus in Engl. Bot. Jahrb. 24: 547 (1898).**

Generic type: *Phyllosma capensis* H. Bol.: CAPE—3219 (Wupperthal): Koudeberg near Wupperthal, Clanwilliam Division, (-AC), 1 200 m alt., 30/8/1886, *Schlechter 8781* (BOL).

DIAGNOSTIC CHARACTERS

The genus *Phyllosma* is distinguished by having: 1. flowers terminal, 2. petals clawed, 3. the disc closing over the ovary at first, 4. staminodes absent, 5. the stigma simple, 6. the style and filaments lengthening greatly and 7. the ovary 5-carpellate.

1. *Phyllosma capensis* H. Bolus in Engl. Bot. Jahrb. **24**: 457 (1898). Type: CAPE—3219 (Wupperthal): Koudeberg near Wupperthal, Clanwilliam Division (—AC), 1 300 m (4 000 ft.), alt., 30/8/1896, *Schlechter 8781* (BOL, holotype; SAM, isotype).

The following description done from fresh material amplifies that previously given by H. Bolus.

Shrubs 0,3–0,4 mm tall, growing from crevices in massive rocks of the Table Mountain Sandstone with several stems arising from a single stem at base. *Branches* short, not very numerous, variously bent; bark rough ashy-grey. *Branchlets* very short, erect, puberulous, not hidden by the leaves. *Leaves* 10–13 mm long, 2,3 mm broad, linear-oblong, thick, alternate, spreading or on new twigs ascending incurved-imbricate; apex mucronate, sub-acute; margins revolute, gland-dotted, densely pubescent at the edge, rounded at the base to a petiole 1,5 mm long, puberulous; adaxial surface at first thinly crisped puberulous becoming sub-scabrid; abaxial surface mostly enfolded with only the midrib showing, very densely short-pubescent; midrib thick, gland-dotted. *Inflorescence* terminal, 3–4 nate, sessile; petals white to pink, spreading about 15 mm diam. *Bract* 5–6,5 mm long, 2,1–1,4 mm broad, lanceolate-caudate, acute, densely puberulous on all sides; margins densely lanate-ciliate, not translucent; midrib prominent, gland-dotted. *Bracteoles* two, 5 mm long, 2 mm broad, lanceolate, acute, sub-apiculate, densely ciliate, puberulous on all sides, reddened above semi-translucent. *Calyx lobes* five, 7–7,5 mm long, 2,2–2,8 mm broad, lanceolate, acute; apex red-mucronate, pubescent; margins densely crisped ciliate; adaxial surface sparsely crisped puberulous above; abaxial surface densely puberulous; midrib prominent, gland-dotted, reddened. *Petals* five, 15 mm long overall; limb 10 mm long, 4,5 mm broad, elliptic, minutely apiculate, 3 or 4 minute hairs at the apex, pinkish-white, narrowed below to a claw 5 mm long, very sparsely pubescent at the throat on all sides but mainly up the midrib. *Staminodes* virtually absent, on the disc between the filaments one can see five minute lumps which are undoubtedly the vestiges of staminodes. *Filaments* five, becoming 11 mm long, hispid. *Anthers* five, before anthesis, 2,5 mm long, 1 mm broad, red at first becoming greenish; apical gland, 0,3 mm diam., sessile. *Pollen* 53 μ long, 22 μ broad, oblong, green. *Disc* flat, level with the base of the filaments, thin with rather irregular membranous flaps pointing inwards towards the style, at first hiding the ovary, green, nectariferous. *Stigma* 0,2 mm diam., sim-

ple, reddened. *Style* becoming 14 mm long, hispid in the lower three quarters. *Ovary* 5-carpellate, 1,2 mm long, 1,3 mm diam.; apices obtuse, densely velvety. *Fruit* 5-carpellate, 6,5 mm long, 5 mm diam., puberulous, gland-dotted and with scattered stalked glands; *horns* 4,2–4,8 mm long, erect, finger-like, obtuse, puberulous, gland-dotted and with scattered stalked glands. *Seed* 4,75 mm long, 1,75 mm broad, black, shining; aril black.

SPECIMENS EXAMINED

CAPE—3219 (Wupperthal): Pakhuis, rocks, Clanwilliam Division (–AA), 21/9/1942, *Esterhuysen* 8027 (BOL, NBG); N. Cedarbergen, in rock crevices along the path from Pakhuis to Heuningvlei, 19/10/1945, *Esterhuysen* 12055 (BOL); Beacon 79, 3 800 ft., 25/9/1969, *Esterhuysen* 32227 (BOL); in montibus circa Pakhuis inter Clanwilliam et Biedouw, c.2 800 ft., –/10/1897, *MacOwan* 3259 (SAM); Bothasberg, Pakhuis Pass, –/9/1936, *Thorne s.n.* (SAM 52690); Koudeberg near Wupperthal, Clanwilliam Division (–AC), 4 000 ft., 30/8/1896, *Schlechter* 8781 (BOL, SAM); in montibus Cedarbergen prope Wupperthal, c. 4 500 ft., 4/10/1897, *Bodkin s.n.* (BOL 8954); Elandskloof, Clanwilliam/Ceres Division (–CA), 26/9/1936, *Lewis s.n.* (BOL 22049), 9/12/1940, *Esterhuysen* 3994 (BOL), 3/10/1940, *Esterhuysen* 3140 (BOL), 4 000 ft., 25/9/1936, *Compton* 6515 (NBG), 3/10/1940, *Bond* 632 (NBG), 30/9/1944, *Compton* 16158 (NBG), 24/9/1974, *Goldblatt* 2753 (NBG); Wabooms River, Ceres Division, 3 500 ft., 25/9/1936, *Compton* 6514 (NBG); Cedarberg, Sugar Loaf near Krom River, Clanwilliam Division, 8/10/1961, *Jackson s.n.* (NBG); Krom River, Clanwilliam Division (–CB), 2 500 ft., 27/9/1934, *Leighton s.n.* (BOL 21583); Ridge S. of Krom River, S. Cedarberg, 3 600 ft., 18/9/1975, *Williams* 2082 (NBG), 4/10/1953, *Esterhuysen* 20483 (BOL, NBG); Gideonkop, S. Cedarberg, Ceres Division, 3 500–4 000 ft., 6/4/1947, *Esterhuysen* 13879 (BOL), –/11/1939, *Stokoe s.n.* (SAM 30636); rocky ridge on farm Suurvlaakte E. of Bokkeveld Sneeuwkop above Winkelhaaks River, Ceres Division (–CD), 20/4/1946, *Esterhuysen* 12701 (BOL), 14/9/1975, *Esterhuysen* 33944 (BOL); Bokkeveld Sneeuwkop, 4 500 ft., 13/9/1975, *Esterhuysen* 33934 (BOL); Kleinveld on track to Bloukop, E. Cold Bokkeveld, 3 500 ft., 24/10/1975, *Williams* 2125 (NBG).

DISTRIBUTION, VARIATION AND BIOLOGY

Phyllosma capensis is found growing from crevices in massive T.M.S. rocks at altitudes of from 760 to 1 370 m (2 500–4 500 ft.) in rather dry situations in the mountains of the Clanwilliam and Ceres Divisions. No significant variation has been observed. The sticky pollen, simple stigma and presence of nectar suggests that this species is pollinated by insects.

The absence of staminodes, the very long hispid style and filaments and the leaves with revolute margins readily distinguish this species.

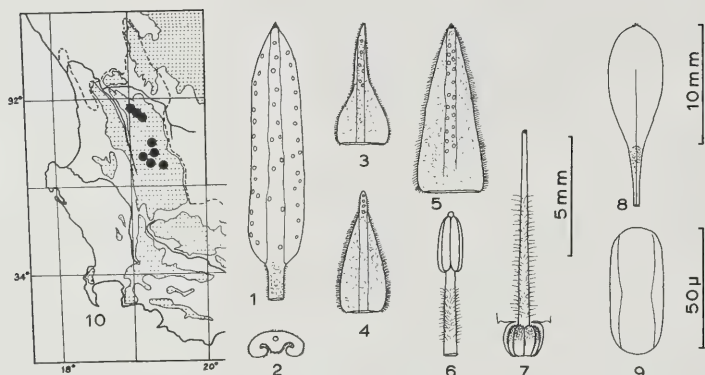


FIG. 1.

Phyllosma capensis: 1, leaf. 2, cross-section of leaf. 3, bract. 4, bracteole. 5, calyx lobe. 6, anther. 7, gynoecium and disc. 8, petal. 9, pollen. 10, distribution.

2. *Phyllosma barosmoides* (Dümm.) Williams, comb. nov.

Acmadenia barosmoides Dummer in Journ. Bot. 51: 221 (1913):—Basionym.
Type: Alpine stony places, Langkloof, *Niven No. 11* (BM, holotype).

Shrubs 0,3 m tall, 0,6–0,9 m across, low, woody, growing from crevices in massive T.M.S. rocks. *Branches* short, glabrous, rough with leaf scars. *Branchlets* short, sparsely pubescent, hidden by the leaves. *Leaves* 6–8 mm long (including the petiole 1 mm long), 2,9–3,8 mm broad, obovate, obtuse, flat, glabrous, crowded, spreading-erect, alternate; apex with a large discoid gland often with another somewhat smaller to either side; margins thick with many gland dots, villous-ciliate at first; adaxial surface smooth, shining; abaxial surface with scattered gland dots, faintly nerved. *Inflorescence* twin, terminal, pink; *pedicel* less than 1 mm long, puberulous. *Bract* 5–6,2 mm long (including the petiole 1 mm long), 2,5 mm broad, leaf-like. *Bracteoles* two, 3,4 mm long, 0,7 mm broad, linear; apex with a flat discoid gland; margins ciliate with a few gland dots to either side above. *Calyx lobes* five, 4,8 mm long, 1,4–1,8 mm broad, oblong, glabrous, ciliate, gland-dotted near the margins above; apex with a flat discoid gland. *Petals* five, 8,5–9 mm long overall, 3,5 mm broad, elliptic, narrowing gradually to 0,5 mm at the base, glabrous; apex with a small point with one or two small hairs to either side. *Staminodes* absent. *Filaments* five, becoming 8 mm long, glabrous, filiform. *Anthers* c. 1 mm long; apical gland absolutely minute, immersed in the cleft between the thecae at the apex. *Pollen* 35 μ long, 23 μ diam., ellipsoid. *Disc* at first closes over the ovary, touches the base of the



FIG. 2.

Phyllosma capensis: Flower with part removed to show the filaments and style.

style, the very slightly larger lobes of the disc are opposite the petals. *Stigma* 0,2 mm diam., simple. *Style* becoming 10 mm long, glabrous. *Ovary* 5-carpellate, 0,8 mm long, 1 mm diam., glabrous; apices globose, inclined inwards. *Fruit* and *seed* not seen.

It appears that up to now the only person to make collections of this species with properly authenticated localities is Miss Elsie Esterhuysen of the Bolus Herbarium at the University of Cape Town. These collections have all come from high rocky places in the Waaihoek Mountains and on the Matroosberg in the South Western Cape. The locality "Langkloof" referred to by Niven therefore cannot refer to the area in Uniondale district known by that name, as stated

by Dümmer (1913). The above description, based upon dried material collected by Miss E. Esterhuysen (28899), amplifies that given by Dümmer.

SPECIMENS EXAMINED

CAPE—3319 (Worcester): Sybasberg, Waaihoek Mountains, sloping rock and ledges, north aspect, Worcester/Ceres Division (–AD), 5 500 ft., 12/1/1954, *Esterhuysen* 22569 (BOL, K); ridge on Waaihoek Peak leading to Tarantula Peak, Ceres Division, 6 000 ft., 15/1/1961, *Esterhuysen* 28732 (BOL); Delville Peak, Waaihoek Mountains and along ridge leading to Mitchell's Peak, Ceres Division, 16/1/1961, *Esterhuysen* 28739 (BM, BOL); Mitchell's Peak, Waaihoek Mountains, amongst rocks on ridge, Ceres Division, 5 600–5 700 ft., 16/1/1961, *Esterhuysen* 28744 (BOL); Waaihoek Peak, rocky ridge on east side of peak, overlooking Witels, Ceres Division, 25/2/1961, *Esterhuysen* 28899 (BOL); Matroosberg, S. E. slopes below "Coat of Arms", Worcester Division (–BC), 5 000 ft., 7/4/1958, *Esterhuysen* 27721 (BOL); Matroosberg, along narrow crest of rocky ridge leading to peak from east-north side, opposite Sonklip, Ceres Division, c. 5 000 ft., 2/6/1968, *Esterhuysen* 31965 (BOL).

Without precise locality: Alpine stony places, Langkloof, *Niven* 11 (BM). Probably Seven Weeks Poort Mtns. 5 800–6 000 ft., –/10/–, *Marloth* 7950 (BOL).

DISTRIBUTION

As far as is known *Phyllosma barosmoides* is to be found growing only in rock crevices on high mountain ridges of the Matroosberg, at altitudes of from 1 500 to 1 800 m (5 000–6 000 ft.).

The absence of staminodes, the very long glabrous style and filaments and the flat leaves with a discoid gland at the apex readily distinguish this plant from all others.

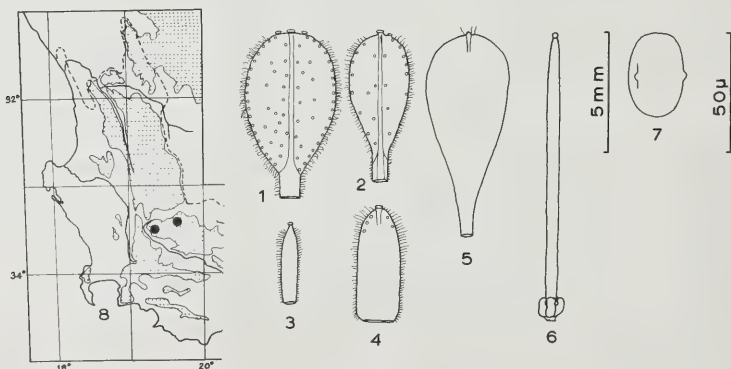


FIG. 3.

Phyllosma barosmoides: 1, leaf. 2, bract. 3, bracteole. 4, calyx lobe. 5, petal. 6, gynoecium. 7, pollen. 8, distribution.

Sheilanthera Williams, gen. nov. (Rutaceae-Diosmeae)

Petala anguste unguiculata sparsim pubescentia. *Staminodia* nulla. *Filamentia* brevia, glabra. *Stylus* brevis, glaber. *Anthera* sparsim pubescentia, glandula sessilia coronata. *Discus* obvallatus, ovarium longe excedens. *Stigma* capitellatum. *Ovarium* dense pubescens. Affinis *Phyllosma* sed ita differt petalo flabelliformi, filamentis styloque perbrevis et stigma capitata.

Sheilanthera is a distinct genus in the Rutaceae, tribe *Diosmeae*, having a flower with the petal narrowly clawed, thinly pubescent at the throat, lacking staminodes, with the filaments and style short and glabrous, with the anther thinly pubescent terminating in a sessile apical gland, with the disc obvallate exceeding the ovary by a long way, with the stigma capitellate and with the ovary densely pubescent. In particular in its fan-shaped petal, very short style and filaments and capitate stigma, it differs from the genus *Phyllosma*.

Type: *Sheilanthera pubens* Williams.

Sheilanthera pubens Williams, sp. nov. propria propter florem staminodiis carentibus, antheris sparsim pubescentibus, et ovario dense pubescenti.

Frutex 0,3–0,4 m, densus, rotundatus, expansus, ad basim monocalis. *Rami* numerosi, breves, patentes, glabri, saepe dichotomi. *Ramuli* numerosi, breves, erectiusculi, pubescentes. *Folia* 6–9 mm longa (petiolo 1 mm longo incluso), 2–2,5 mm lata, elliptico-oblonga, obtusa, alterna, patentia; marginibus revolutis crassis glanduloso-punctatis; costa conspicua lateri-pubescenti. *Inflorescentia* 9 mm diam., terminalia 1–3 nata, primo rosea. *Bractea* 3,3 mm longa, 1,5 mm lata, lanceolata, sub-acute, villosa; marginibus villosa-ciliatis, glanduloso-stipitatis. *Bracteolae* duae, 3 mm longae, 1 mm latae, lanceolatae, acutae; marginibus crispo-ciliatis, glanduloso-stipitatis; pagina abaxiali villosa; pagina adaxiali sparsim pubescenti, 1–3 glanduloso-punctata. *Sepala* quinque, 3,3–3,5 mm longa, 1,7–2,5 mm lata, ovato-lanceolata, sub-acute; marginibus villosa-ciliatis, ad apice stipitato-glandulosis. *Calyx* pubescens, stipitato-glandulosus. *Petala* quinque 6 mm longa; *limbus* 3,5–4 mm longus, 3,8–4,5 mm latus, flabellatus, ad basim sparsim pubescens; *unguis* 2,5 mm longus, 0,7 mm latus, linearis. *Staminodia* nulla. *Filamenta* quinque, 2 mm longa, acicularia, glabra. *Antherae* quinque, ante-anthesin 1,2 mm longae, 1 mm latae, vinosae, sparsim pubescentes, glandula sessilia coronata. *Pollen* 38 μ longum, 16 μ latum, oblongum. *Discus* obvallatus, ovarium longe excedens, nectarifer. *Stigma* 5-lobatum, 0,3 mm diam., viridum, capitellatum. *Stylus* 1,5 mm longus, erectus. *Ovarium* plus-minusve 0,5 mm longum, plus-minusve 0,7 mm latum, dense pubescens. *Fructus* et *semen* incognitus.

Type: CAPE—3219 (Wupperthal): ridge S. E. of Bloukop, eastern Cold Bokkeveld, Ceres Division (—CB), 1615 m (5 300 ft.) alt., 24/10/1975, Williams 2122 (NBG, holotype; K, PRE, MO, S, BOL, STE, M, NSW).

This unique plant was discovered by Miss Elsie Esterhuysen in 1958 on Bloukop in the Cold Bokkeveld. As far as is known it is confined to this locality, and to one other nearby, and had never been collected by anyone else. A section of the stem 18 mm in diameter showed about 50 annual growth rings.

Shrubs 0,3–0,4 m tall, dense, rounded, spreading, single-stemmed at base. *Branches* numerous, short, spreading, glabrous, often dichotomous; bark brown, smooth, leaf scars not very prominent. *Branchlets* numerous, short, fairly erect, pubescent, light brown in colour. *Leaves* 6–9 mm long including the 1 mm long petiole, 2–2,5 mm broad, elliptic-oblong, obtuse, alternate, spreading; margins revolute, thick, with large immersed gland dots adjacent to small glandular tumuli; adaxial surface convex glabrous with a shallow median groove; abaxial surface densely pubescent in two grooves adjacent to the conspicuous gland-dotted midrib; new leaves are normally villous with stipitate glands having reddish resinous tips. *Inflorescence* terminal 1–3 nate, 9 mm diam.; petals pink fading to white. *Bract* 3,3 mm long, 1,5 mm broad, lanceolate; apex sub-acute with several stipitate glands; margins villous-ciliate with stipitate glands; adaxial surface villous, somewhat concave; abaxial surface densely crisped pubescent; midrib slightly gibbous towards the apex. *Bracteoles* two, 3 mm long, 1 mm broad, lanceolate; apex acute with a stipitate gland; margins crisped ciliate with stipitate glands; adaxial surface sparsely pubescent with one to three gland-dots towards the apex; abaxial surface villous. *Calyx* pubescent with scattered stipitate glands. *Calyx lobes* five, 3,3–3,5 mm long, 1,7–2,5 mm broad, ovate-lanceolate, sub-acute, pubescent; apex and upper margins with sticky stipitate glands; margins villous ciliate. *Petals* five, 6 mm long overall; *limb* 3 mm long, 3,8–4,5 mm broad, fan-shaped, thinly villous below, spreading; *claw* 3 mm long, 0,7 mm broad, linear, erect. *Staminodes* absent, there is no space between the erect claw and the narrow rim of the disc. *Filaments* five, becoming 2 mm long, erect, glabrous, acicular, reddened. *Anthers* five, 1,2 mm long, 1 mm broad, wine-coloured, rather thinly pubescent, apical gland sessile. *Pollen* 38 μ long, 16 μ broad, oblong. *Disc* obvallate, exceeding the ovary by a long way, wine-coloured, sinuate, level, exudes nectar. *Stigma* 5-lobed, 0,3 mm diam., capitellate, dark green. *Style* becoming 1,5 mm long, glabrous, erect, wine-coloured. *Ovary* 5-carpellate, $\pm$ 0,5 mm long, $\pm$ 0,7 mm diam., densely pubescent; each lobe with a globose apical gland. *Fruit* and *seed* not seen.

SPECIMENS EXAMINED

CAPE—3219 (Wupperthal): Blaauwkop, Cold Bokkeveld, rocky plateau and amongst rocks, Ceres Division (–CB), 4 500–5 500 ft. alt., 1/10/1958, Esterhuysen 27889 (BOL, K, MO, S, LD, L, UC, M, C, GRA, E); ridge S.E. of Bloukop, eastern Cold Bokkeveld, Ceres Division, 1615 m (5 300 ft.) alt., 24/10/1975, Williams 2122 (NBG, K, PRE, MO, S, BOL, STE, M, NSW); Bok-

keveld Sneeuwkop, rocky koppie below the shale band on the north side, Ceres Division (-CD), 30/3/1963, *Esterhuysen s.n.* (BOL).

DISCUSSION

Sheilantha pubens is a unique species that differs from all species of: *Acmadenia* which possess staminodes, have the anther glabrous and the ovary not densely pubescent;

Adenandra which have anthers with stipitate glands;

Agathosma which have a range of staminodes from terete to petaloid;

Coleonema which have staminodes connate with the petal;

Diosma which have sessile petals and the disc spreading;

Euchaetis which have transversely bearded petals;

Macrostylis which have the style and filaments protruding a long way and the ovary usually 3-carpellate;

Phyllosma which has the style and filaments very long and the stigma minute or simple.

It possesses leaves similar to those of *Phyllosma* with rolled-in margins and has stipitate glands similar to those found in *Acmadenia bodkinii* (Schltr.) Strid, *Acmadenia rourkeana* Williams (ms.), *Acmadenia macradenia* (Sond.) Dümmer and *Phyllosma barosmoides* (Dümmer) Williams.

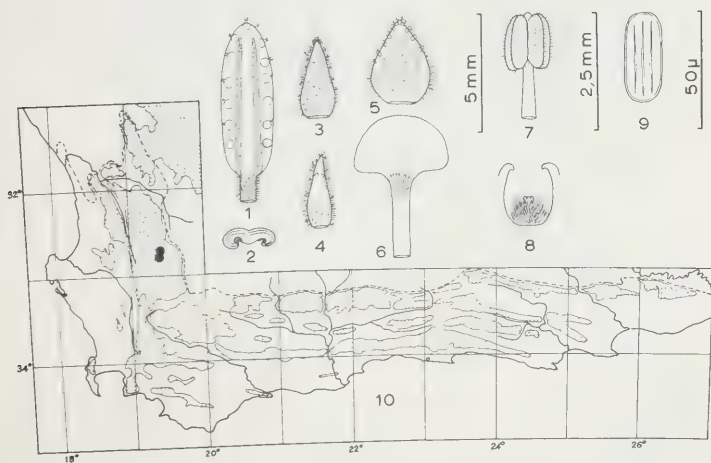


FIG. 4.

Sheilantha pubens: 1, leaf. 2, cross-section of leaf. 3, bract. 4, bracteole. 5, calyx lobe. 6, petal. 7, anther. 8, gynoecium with disc. 9, pollen. 10, distribution.



FIG. 5.

Sheilanthera pubens: Flower showing clawed petals and pubescent anthers.